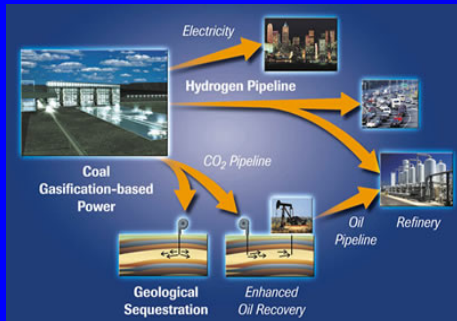


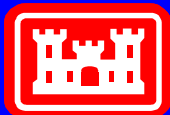
DoD Stationary Fuel Cell Demonstrations & Research

**Secure, Reliable, Efficient Energy
Home Station to Foxhole**



Franklin H. Holcomb
Project Leader, Fuel Cell Team

Ph. 217-373-5864
f-holcomb@cecer.army.mil
www.dodfuelcell.com



US Army Corps
of Engineers

04 APR 07

Engineer Research and Development Center

Presentation Outline

- **Intro to U.S. Army ERDC**
- **Our Challenge**
- **Fuel Cells 101**
- **DoD Applications of Fuel Cells**
- **Your Challenge**
- **Conclusions**

Soldiers, Families, and Civilians

Home to
the
Force



Power
Projection



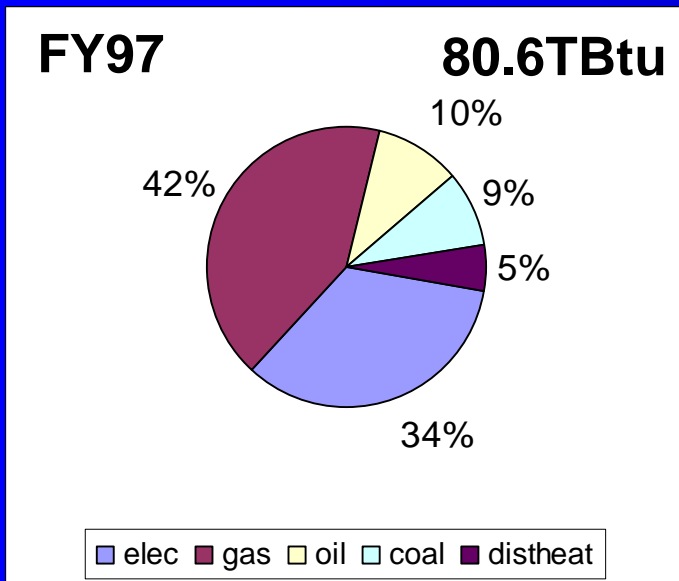
Work &
Training



... are our Customers!

DoD Fuel Cell Technology Stationary Goals

- The Army Spends ~ \$1B Annually for Energy *
- Fixed Facilities Consume ~ 73% of this Energy
- DoD Environmental Compliance
- Energy Quality, Reliability, and Security



* Source: Army Energy Management Plan, May 2000



Rumaylah Oil Fields, Iraq (April 02, 2003) - U.S. Army Sergeant Mark Phiffer stands guard duty near a burning oil well in the Rumaylah Oil Fields in Southern Iraq.

A “Real” Fuel Cell

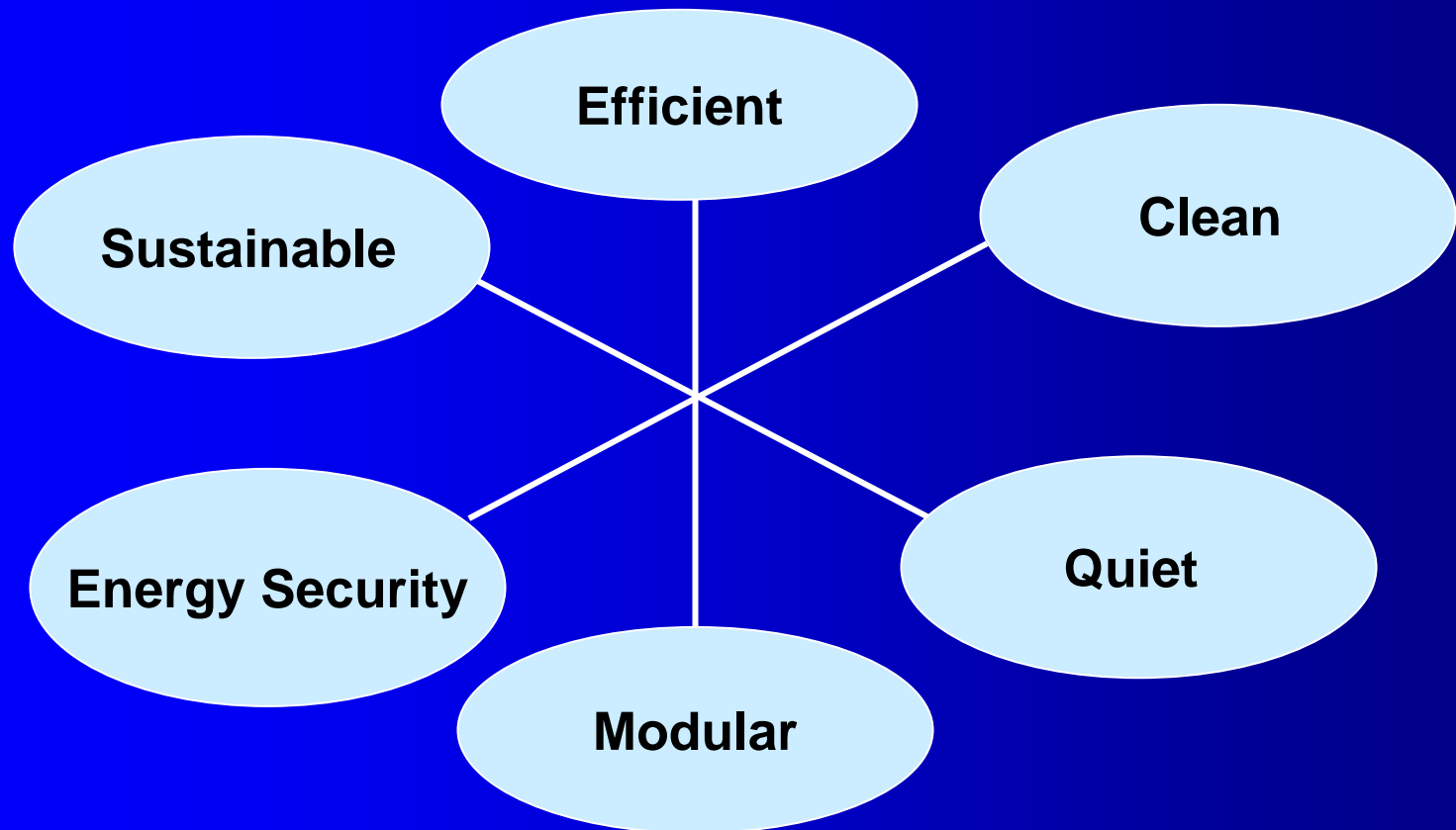
Hydrogen
Fuel



Electricity
(DC)

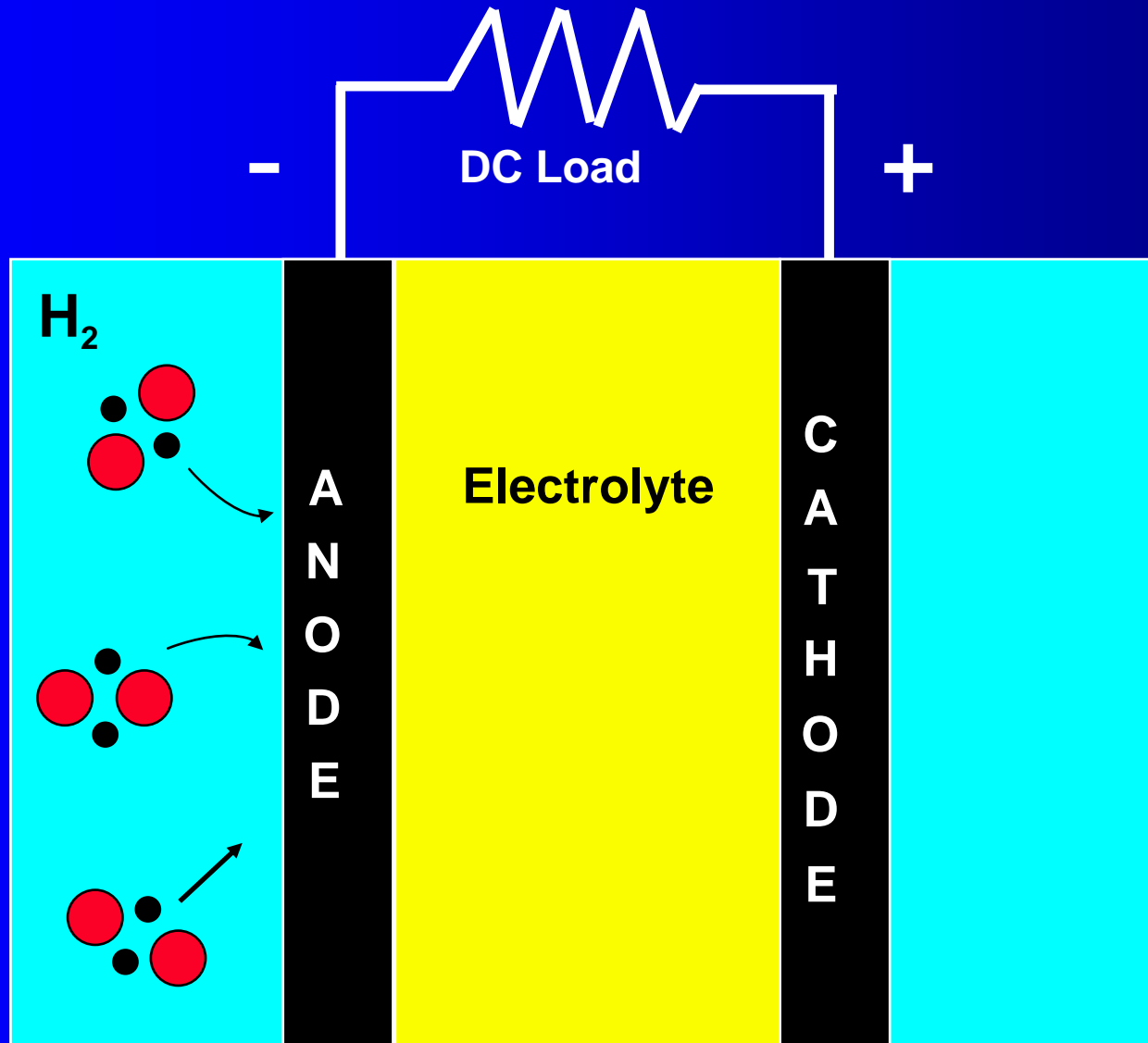
Cells

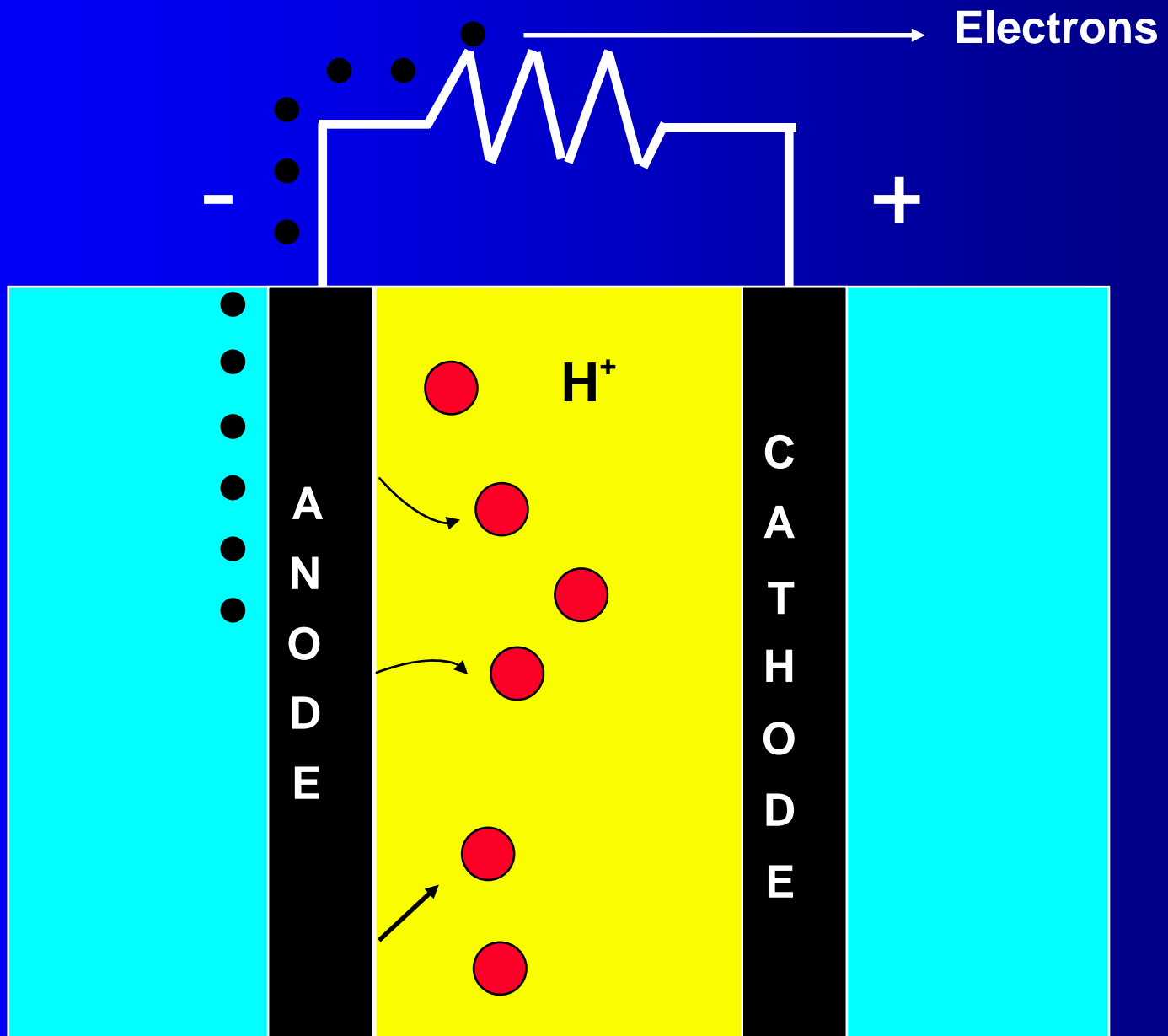
Benefits of Fuel Cells

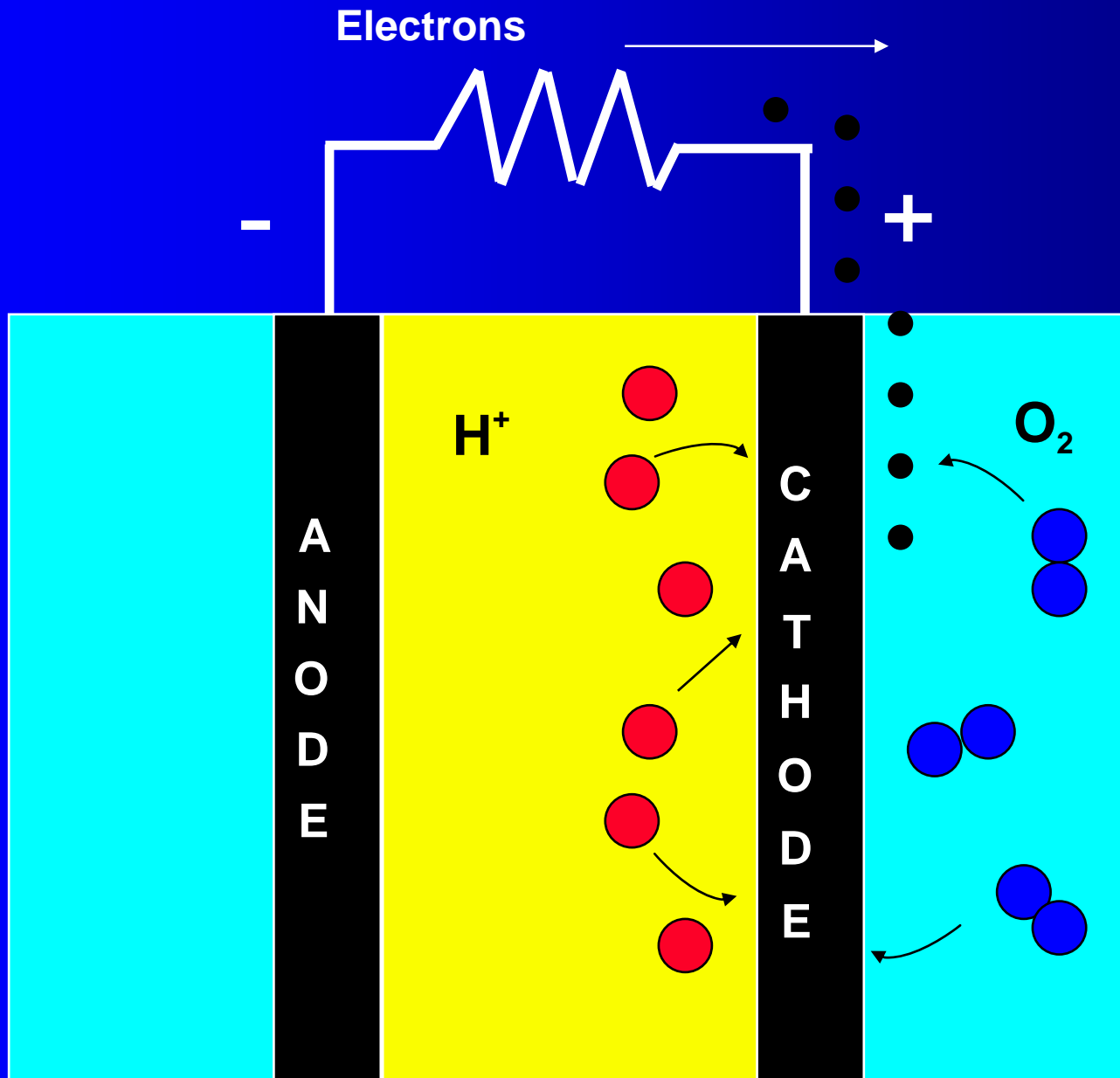


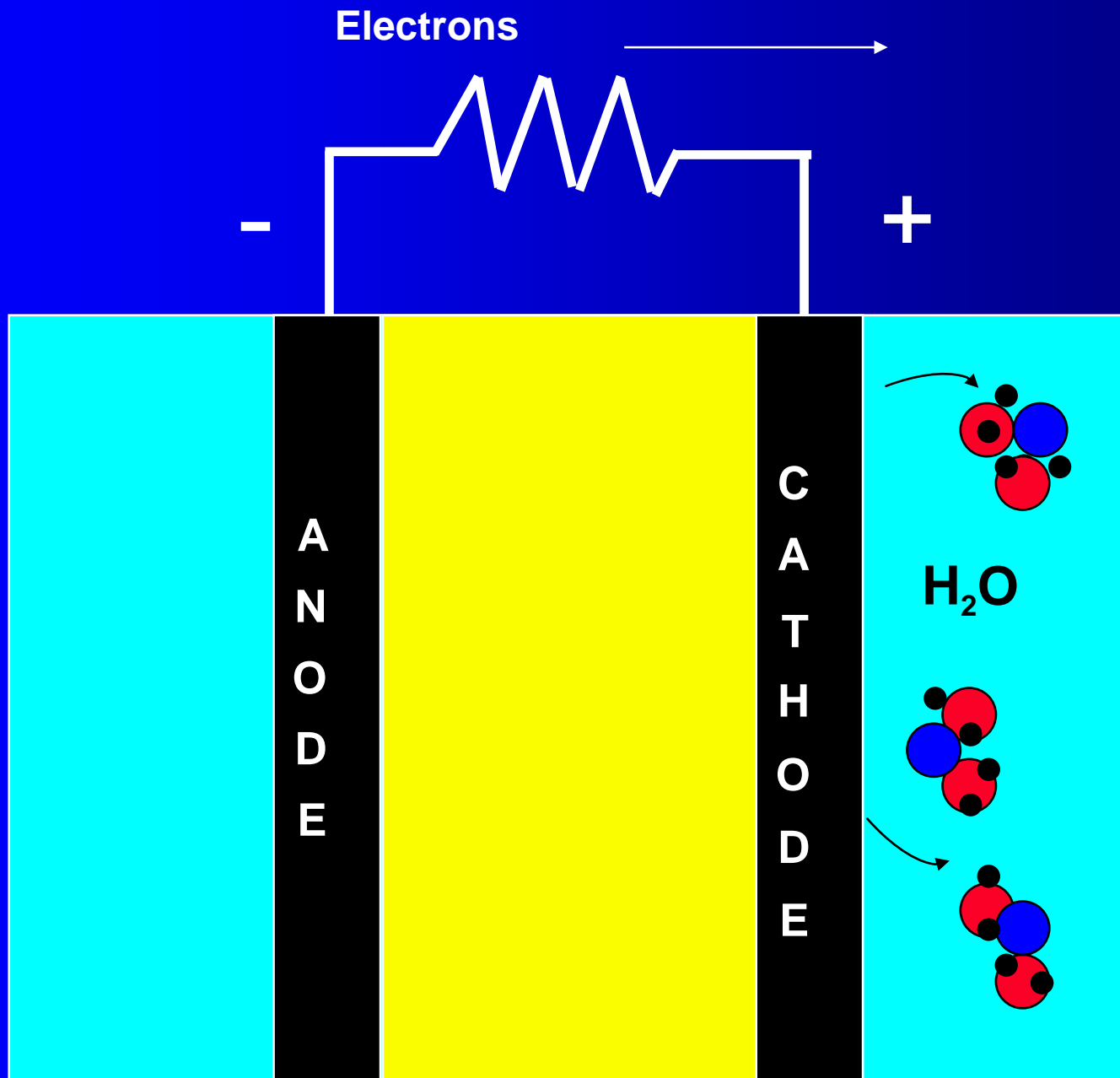
Adapted from the Fuel Cell Education Project

Basic Fuel Cell Operation

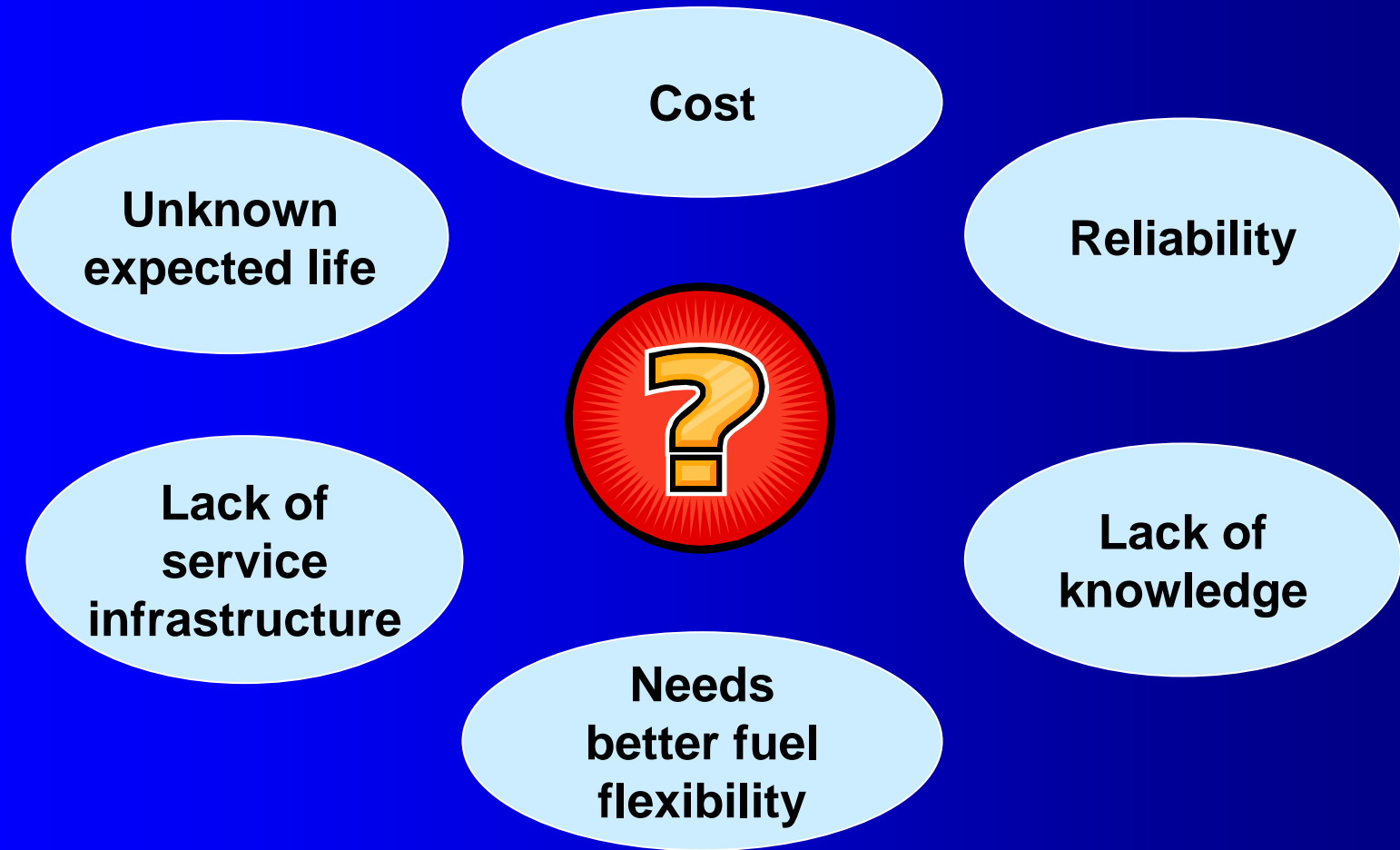






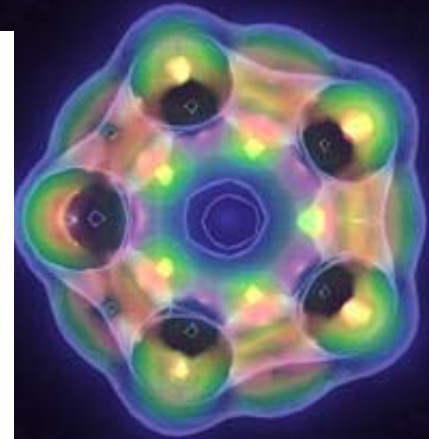
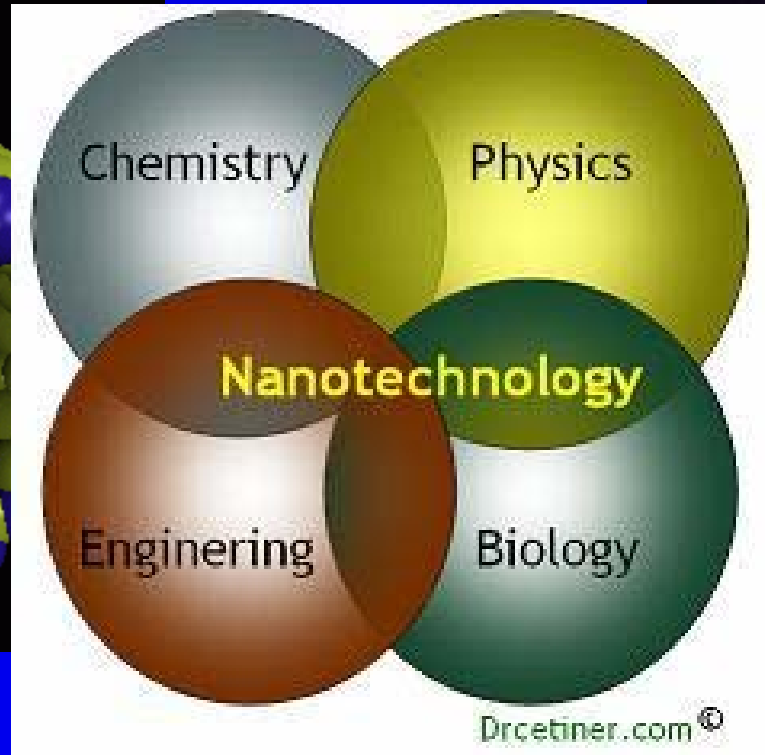
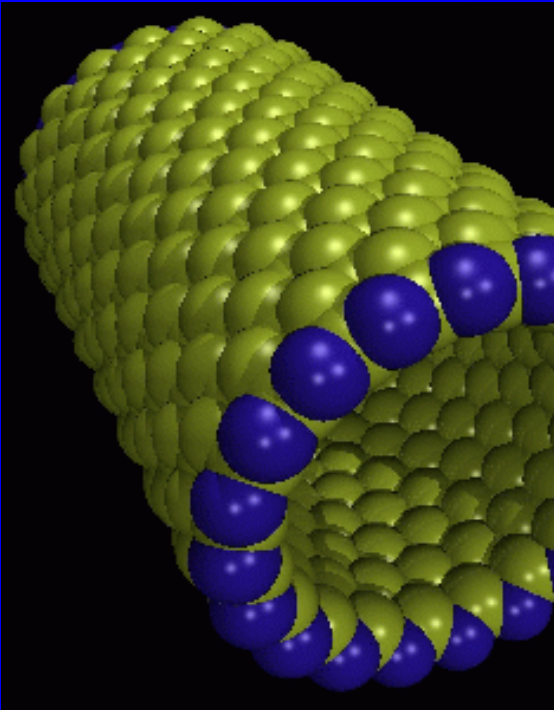


Challenges to Fuel Cell Commercialization



Adapted from the Fuel Cell Education Project

Nanotechnology – Breakthrough Science



PEM Fuel Cell Demonstration Sites



**Watervliet Arsenal
Officer's Quarters**



**ERDC-CERL
Equipment Building**



**USCG Facility
Maintenance Building**



**U.S. Border Patrol
Radio Repeater Station**



**Arizona State University
Army Reserve Building**



**Keflavik Airport, Iceland
Telecommunications Backup**

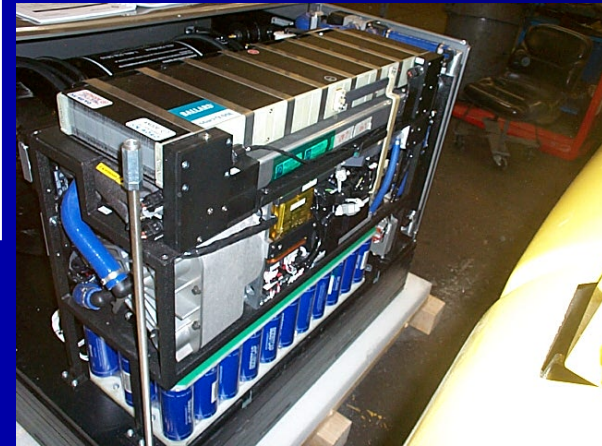
LTC Massie Residence West Point, NY



Army's First Fuel Cell Truck



Fuel Cell Forklift at Army National Guard Base



General Hydrogen's Fuel Cell Pack

Forward Deployments



- Base Camps
- Life Support Areas
- Advanced Operations Base
- Forward Operations Base
- Tactical Operations Center
- Etc.



Stryker Vehicle With MREF-APU

“Silent Watch” Capability

HyPM 7

Generates power on-demand for silent watch mission use.



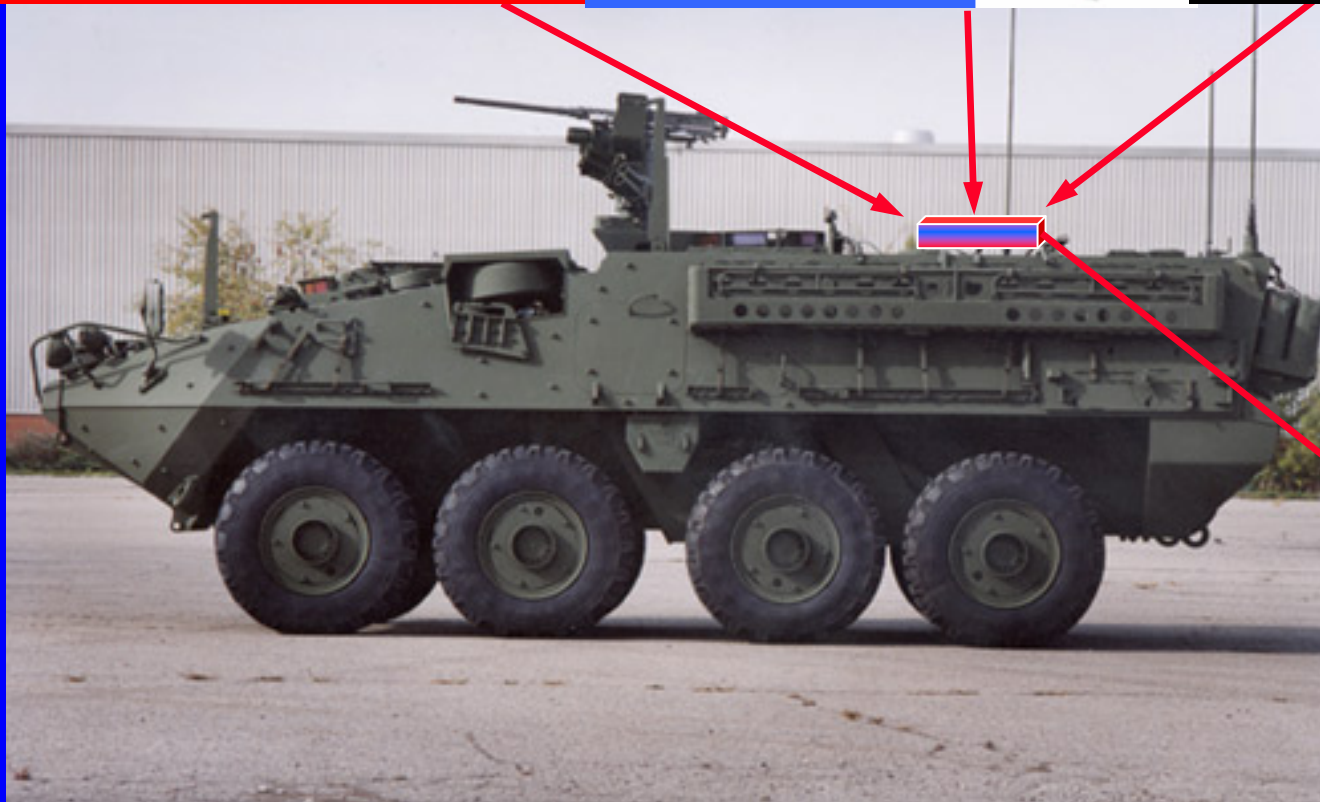
HyLZER 2.0

Generates Hydrogen for storage and later use by HyPM 7



Metal Hydride

Stores Hydrogen at low pressure for use on-demand by HyPM7 during power generation



Current Prototype System is located behind turret and in front of the rear hatch ports of egress. System also includes on-board water storage vessel.



Soldier Applications of Fuel Cells...



Dismounted Battle
Command System



Commander's Digital
Assistant



MicroLight Enhanced
Position Location Reporting
System (EPLRS)



Mounted Warrior



Land Warrior



Multiband Inter/Intra
Team Radio (MBITR) AN/
PRC-148(V)(C)



Dismounted-Combat ID
Marking System (D-CIMS)

Marines used 3,000 batteries/day in Gulf War!

Your Challenge

- Conserve Energy When Possible
- Educate Yourself on Where Energy Comes From and How Used
- Study Math, Physics, Basic Sciences
- Make a Difference in the World, Help Achieve Energy Independence

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DoD FUEL CELL

ERDC/CERL Projects

PAFC Demonstration | Climate Change Rebate Projects | DoD Hydrogen Initiatives
Residential Demonstration | Research & Development | FC Test & Evaluation Center

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Construction Engineering Research Laboratory

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